

Fbgkkl_jkl\h gZmdb b \ukr_]h h[jZah\Zgby Jhkkbckdh
N_^_jZevgh_]hkm^Zjkl_ggh_ [x^`_lgh_ h[jZah\ZI_ev
 \ukr_]h h[jZah\Zgby
©Kfhe_gkdbc]hkm^Zjkl_gguc mgb_jkbl_l^a

DZn_^jZ fZI_fZlBq_kdh]h ZgZeBaZ

«Утверждаю»

ljhj_dlhj ih m_q_[gh
f_lh^bq_kdhc jZ[hI_
BBBBBBBBMklbf_gdh X
©^a k_gly[j9]

И **И** kpbiegu

GZijZ\e_gb_ ih^01h04db
GZijZ\e_gghklv jdhzBgv -b

NhjfZ h[mq_hgpyZ ±
Dmjk ±
K_f_kl? ±
<k_]h aZqzlguo3_^pZghp8 ±
NhjfZ hlq_lghklb kaZ_qzlj ±

ljh]jZffm jZajZ[hIZe
^hdlhj nb^Zd_hfZlBq_kdbo gZme; h]hpk_hgl :

H^h[j_gZ gZ aZk_^Zgbb dZn_^ju
© ^a Z\]mkIZ] ijhlhdhe <

Kfhe_gkd
2020

1.

HI

Dmj©G_ij_ju\gu_ fZI_fZlBq_kdblgfhkbl_keyb^d h[yaZI_evgu
 bamq_gby ^bkpbiebgZf mq_[gh]h ieZgZ gZi4Z\e_lgbdyeZhgZhy
 fZI_fZlBdbZgmhjZlbdZ Hg bllarkgZ_kkjy \
 >ey mki_rgh]h hk\h_gby ^Zgghc ^bkpbiebg g_h[oh^bfu
 knhjfbjh\Zggu_ ijb bZddp_ogb^bkpbieb@FZdZfZlBq_kdhf ZgZ
 ©>bnn_j_gpbZemgZ\g^gb@MjZ\g_gby6ZlBZ_kdhc nbabdbgv m
 [ZdZeZ\jbZIZ
 ljb ih^]hlh\ddZ]bkh\ ih ^Zggghfm gZijZ\e_gbx mf_gb
 fZI_fZlBq_kdb_ fh^_eb b agZgb_ kihkh[h\ j_rjZgbyuqjbrdeZ^kg y
 gZmdb b l_bfg_kdb[hevrrh_ agZq_gb_ ihkdhevdm \u[jZggZy l
 ^_yl_eVghkdZd ijZ\beh k\yaZgZ k g_h[oh^bfhkgv_xj_bjauqgu_gb
 nbabq_kdbo ijhp_wdkgh\fbq_kdbo [bheh]bq_kdbo b kldmbjZev
 ihkljh_g lZd qh[u m]em[blv b jZkrbjblv h[t_f agZgbc ih
 hkgh\gufb \hijhkZfb fZldfZlBqgebjh\Zghkxh_gb_ ^Zgghc ^bkp
 g_h[oh^bfh ^ey bamq_gby lZdbFoz^bfZlBqebgdZfch ©_eb iZjZee
 jZkij_^_e_gghc h[jZ[h^db ^]Zgguo
 Bamq_gb_ dmjkZ hkgh\Zgh gZ lJZ^bpbhgguo f_lh^Zo
 \aZbfhk\yab_khgukf dmjkZfb gZ bkihevah\Zgbb kh\j_f_g
 f_lh^bq_kdhc ebl_jZlmju Z lZd`_gZ ijbfg_g_gbb kh\j_f_gguo
 ^ey fh^_ebjhZigbyu\g uijhp_kkh\

2.

| Dhfi_l_gpby | Bg^bdZlhju ^hklb`_gby |
|-----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| -1.Kihkh[_g j ZdlmZevgu_ nmg^Zf_glZevghc ijbdeZ^ghc fZI_fZI | kh\j_f_gguc ZiiZjZI fZI_fZlBd f_lh^bdb b Ze]hjbIfu _]h ijbfg_g_g ZdlmZevguo aZ^Zq nmg^Zf_glZev fZI_fZlBdb \u[bjZlv g_h[oh^bfu_ f_lh^u j_rZlv aZ^Zqb nmg^Zf_glZevghc fZI_fZlBdb gZ\udZfb j_r_gby [Zah\ nmg^Zf_glZevghc b ijbdeZ^ghc fZI_ |

KhZbbkpbiebg

\ .F_lh^u
 ihkljh_gbyij_gu\guo fZI_fZlBq_kdbo fh^_e_c AZ^Zqb
 ^bnn_j_gpbZevmZ\g_gbyf Ebg_cgu_g_bgug_eb[udgh_gg
 ^bnn_jpbgZevgu_ mjZ\g_gby b kbkl_fu MjZ\g_gby \qZklguo i
 2 . MjZ\g_gby
 jZkijhkljZg_gby\udmdhe_[Zgbc HibkZgb_ jZkijhkljZgh_gby
 mjZ\g_gb_ MjZ\g_gb_ lmZkkhgZ EZieZkZ =_evf]hevpZ
 3
 WdhghfbdZ dZd ^bgZfbq_kdZy kbk
 Khehm Fh^ZgkZ Fh^_ev jZa\blby ihimeyppEZgZkleyZ\Fhgu
 FZevlmkZ Fgh]hmjh\g_\Zy khpbZevgZy fh^_ev DjB\Zy >`bgg

4. 4

| i | JZa^_eu bl_fu | <k_ qZk | Nhjfu aZgylbc | | |
|----|-----------------------------------------------------------------------|------------|---------------|---------------------------|---------------------------------|
| | | | E_dp | ljZdlb q_kdb aZgylb | KZfhk lhyl_ev g jZ[hIZ |
| 1. | <_^_gb_ ybx_hg_ij_ju\ fZI_fZlq_kdh^_e_c | 30 | 4 | 4 | 22 |
| 2. | FZI_fZlq_kdh_ fh^_ nbabq_kdb ijhp_kkh\ ^ | 38 | 6 | 6 | 26 |
| 3. | FZI_fZlq_kdh_ fh^_ ^bzfbq_kdbo fbvq_dhkgf [bheh]bq_kdbo b khpbZ | 40 | 6 | 6 | 28 |
| | <k_]h aZ k | 108 | 16 | 16 | 76 |

h

h h h

lhgylb_ h fZI_fZlq_kdh fh^_ebjh\Zgbb Hkh[_gg
fZI_fZlq_kdh]h fh^_ebjh\Zgby Hkgh\ghc ZiiZjZI lhgylb_
fh^_eb ljhkl_crZy fh^_evfh^_ev Evgg Evgg Evgg Evgg
ljk_crZy fh^_ev fh^_ev FZevlmkZ Eh]bkibq_kdZy fh^_ev

>bnn_j_gpbZevgu_ mjZ\g_gby b bo kbkl_fu dZ
ihkljh_gby g_ij_ju\ghc fZI_fZlq_kdhc fh^_eb Mklhcqb\hkl
hkgh\guo \hijhkh\ bkke_^h\Zgb_mklhcqb\hklb
mjZ\g_gby b kbkl_fu ^bnn_j_gpbZevgu_ mjZ\g_gby
kbkl_f Bkke_^h\Zgb_ mklhcqb\hklb ih i_j\hfm ijb[eb`_gb
ihklhyggh ^_ckl\mxsbo \hafms_gbyo

Edpby >bnn_j_gpbZevgg_gby mjZ\ qZklguo ijhba\h^guo
fh^_e_c hibku\Z_fuo ^bnn_j_gpbZevgufb mjZ\g_gbyfb \
F_lh^u jZkq_IZ fh^_eb oc ljb_f_j jZkijhkljZg_gbjZg_gghf b
g_h]jZgbq_gghf h[t_f_

Edpby HibkZgb_ ijhp_kkh\ i_j_ghkZ JZkijhkljZg_gb_
Hklu\Zgb_ djm]eh]Hklh\evg\Zgb_ ki_rpbZevguo Nbabq_kdbc
y\ev_gbc

Edpby Nbabq_kdb_ fh^_eb hibku\Z_fu_ weebilbq_kdbfb
>bjboe_ b G_cfZgZ_ JZkijhkljZg_gbjZg_gghf b
i_j_f_gg Wee_f_g_lbjbb ihl_gpbZeZ F_lh^ nmgdpbb =jbgZ

Edpby MjZ\g_gb_ =_evf]hevpZ dZd ^jm]hc lbi weebilb
Nbabq_kdbc kfuke _]h j_r_gbc \ aZ\bkib\hklbgthl ajhZevg
weebilbq_kdh]h mjZ\g_gb^dZ d mjZ\g_gbx =_evf]hevpZ Mkeh

Edpby FZI_fZlq_kdb_ fh^_eb \ wdghghfd_ Djb\Zy >`bg
mklZgh\ev_gby jZ\gh_kghe p_gu ;Zah\evg\hklbgthl ajhZevg
wdghghfbq_kdh]h jhklZ

FZl_fZlBq_kdb_ f h e b q_kdb o b k h p b Z e v g u o _ k b k l
jZa\b l b y i h i m e y p b c F h ^ _ e v \ h c f g h ^ E e Z v g d Z Z k d \ j z k Z F g h] h m j
k h p b Z e v g Z y f h ^ _ e v

.Lbiu fZl_fZlBq_kdb o f h ^ _ e _ j c [H H Z g b \ y g u
d f h ^ _ e b

Kh^ j`Zgb_aZgylby

- 1. DeZkkbnbdZpby fZl_fZlBq_kdb o f h ^ _ e _ c
- 2. l j b g p b i _ ^ b g k l \ Z b f g h ` _ k l \ _ g g h k l b f h ^ _ e _ c
- 3. H k g h \ g u _ l j _ [h \ Z g b y d f h ^ _ e b
- 4. F Z l _ f Z l B q _ k d Z y Z ^ _ d \ Z l g h k l v f h ^ _ e b
- 5. H k g h \ g u _ w l Z i u i h k l j h _ g b y f Z l _ f Z l B q _ k d h c f h ^ _ e b

Z b k d h _ < 2. D Z q _ k l \ _ g g u c Z g Z e b a k b k l _ f ^ b n n _
m j Z \ g _ g b c

Kh^ j`Zgb_aZgylby

- 1. N Z a h \ u c i h j l j _ l k b k l _ f u ^ b n n _ j _ g p b Z e v g u o m j Z \ g _ g b c
- 2. M k l h c q b \ h k l v e b g _ c g h c k b k l _ f u
- 3. : g Z e b i h k l _ c r b o f h ^ _ e _ c
- 4. F h ^ _ e v E - h \ d Z v l _ j j Z

F h ^ _ e b k b k i e v a h \ Z g b _ f m j Z \ g _ g b c
i j h b a \ h ^ g u o

Kh^ j`Zgb_aZgylby

- 1. > b n n _ j _ g p b Z e v g u _ m j Z \ g _ g b y \ q Z k l g u o i j h b a \ h ^ g u o H
- 2. l j b f _ j u f h ^ _ e v g u o a Z ^ Z q
- 3. J _ r _ g b _ \ h e g h \ h] h m j Z \ g _ g g Z y j y W h e _ d l j h g
- 4. M j Z \ g _ g b _ R j _ ^ b g] _ j Z

< F h ^ _ e v i _ j _ g h k Z b a e m q _ g b y Q b k e _
j _ r _ g b y m j Z \ g _ g b y i _ j _ g h k Z

Kh^ j`Zgb_aZgylby

- 1. H [k m ^ ^ _ g b _ l _ h j _ l b q _ k d h] h f Z l _ j b Z e Z
- 2. H [k m ^ ^ _ g b _ l _ f u @ B g h _] j h g p b Z e v g h _ m j Z \ g _ g b _ i _ j _ g l
_ h j _ r _ g b y ^ i j ^ e h ^ _ g g h c ^ e y k Z f h k l h y l _ e v g h] h b a m q _ g b y
^ h d e Z ^ u k i j _ a _ g l Z p b y f b l j b f _ j g u _ l _ f u ^ h d e Z ^ h \
- @ u \ h ^ m j Z \ g _ g b y i _ j _ g h k Z b h [e Z k l b _] h i j b f _ g _ g b y
@ Q b k e _ g g u _ f _ l h ^ u j _ r _ g b y m j Z \ g _ g b y i _ j _ g h k Z
@ j b [e b ` _ g g u _ f j l r ^ g b y m j Z \ g _ g b y ^ i _ j _ g h k Z
- 3. H [k m ^ ^ _ g b _ f Z l _ j b Z e h \ ^ h d e Z ^ h \

< F h ^ _ e b k b k i e v a h \ Z g b _ f w e e b i l b q _ k d
Kh^ j`Zgb_aZgylby

- 1. W e e b i l b q _ k d b _ m j Z \ g _ g b y
- 2. J _ r _ g b _ a Z ^ Z q b > b j b o e _ ^ e y i e h k d b o b i j h k l j Z g k l \ _ g g u
- 3. N b a b q _ k d Z y l j Z d l h \ d Z
- 4. J Z a e b q g u _ f _ l h ^ u j _ r _ g b y

< F h ^ _ e b k b k i e v a h \ Z g b _ f m j Z \ g _ g b y =
Kh^ j`Zgb_aZgylby

- 1. M j Z \ g _ g b _ = _ e v f] h e v p Z J _ r _ g b _ m j Z \ g _ g b y = _ e v f] h e v

2. ljb_^_gb_ weebilbq_kdZ]h m hZy g mZy g_gbx =_evf]hev
Mkeh\by baemq_gby

II < 7. G_ij_ju\guZl_ffZlbq_kdb_\fw d h g b f b d_
Kh^ j`Zgb aZgylby

1. L_fZF@l_fZlbq_kdb_\fw d h g b f b d_ ^eZ]Z_lky ^ey kZfhklhy
bamq_gby lh ^Zgghc l_f h d e Z ^ h \ l k y i j _ a _ g l Z p b y f b l j b f _ j g
^ h d e Z ^ h \
F h ^ _ e b d h g d m j _ g p b b
K b k l _ f Z @ j i k l m j k b l _ e v ^ a k g _ a Z \ b k b f u f j _ k m j k h f
a Z b f h h l g h r _ g b y \ k b k l _ f j l c a b s g b d
W \ h e x p b h g g Z y h i l b f Z e v g h k l v e u ` b \ r b o \ b ^ h \
2. H[km`^_gb_ fZI_jbZeh\ ^hdeZ^h\
I b k d h a z y l b _

III < 8. @_kldb_ b fy]db_ fZI_fZlbq_kdb_ fh^
khi_jgbq_kl\Z
Kh^ j`Zgb aZgylby

1. L_fZ @@_kldb_ a b @fy]db_ a fZI_fZlbq_kdb_ fh^_eb
kZfhklhyl_evgh]h bamq_gby lh ^Zgghc l_f_]h h \ y l k y ^ h
l j b f _ j g u _ l _ f u ^ h d e Z ^ h \
F h ^ _ e v \ h c g u b e b ^ a k j Z ` _ g b y
H i l b f b a Z p b y d Z d i m l v d d Z I Z k l j h n _
@ _ k l d Z y f h ^ _ e v d Z d i m l v d h r b [h a g u f i j _ ^ k d Z a Z g b y f
H i Z k g h k l v f g h] h k l m i _ g q Z I h] h m i j Z \ e _ g b y b f Z I _ f z
i _ j _ k l j h e d b
2. H[km`^_gb_ fZI_jbZeh\ ^hdeZ^h\
3. H[km`^_gb_ fh^_e_c
= h g d Z \ h h j m ` _ g b c f _ ` ^ m ^ \ m f y k l j Z g Z f b
; h \ u _ ^ _ c k l \ b y ^ \ m o Z j f b c
4. J_r_gb_ aZ^Zq
5. lh`^_gb_ blh]h\ bamq_gby dmjkZ

IV
l_j_q_gv l_f ^ey kZfhklhyl_evgh]h bamq_gby
Bgl_j] b n n _ j _ g p b Z e v g h _ m j z h g Z g b _ f _ i l h ^ u _] h j _ r _ g b y
@ _ k l d b _ a b @ f y] d b _ a f Z I _ f Z l b q _ k d b _ f h ^ _ e b
W d h g h f b d Z d Z d ^ b g Z f b q _ k d Z y k b k l _ f Z
F h ^ _ e v K h e h m
F h ^ _ e v W \ Z g k Z
F h ^ _ e v j Z a \ b l b y i h i m e y p b c
F h ^ _ e v \ h c g u E Z g d Z k l _ j Z
F h ^ _ e v F Z e v l m k Z
F g h] h m j h \ g _ \ Z y k f h p b Z e v g Z y
D j b \ Z y > ` b g g b

6. **II**

II

I **I** **I** **I** **I** **d**

I

I

1. DeZkkbnbdZpby fZI_fZlBq_kdbo fh^_e_c
 ljbgbpi_^bgkl\Z b fgh`_kl_gghklb fh^_e_c
 Hkgh\gu_ lj_[h\Zgby d fh^_eb
 FZI_fZlBq_kdZy Z^_d\Zlghklv fh^_eb
 Hkgh\gu_ wIziu ihkljh_gby fZI_fZlBq_kdhc fh^_eb
 NZah\uc ihjlj_l kbkl_fu ^bnn_j\ggpbbZevguo mjZ
 Mklhcqb\hklv ebg_cghc kbkl_fu
 :gZeba ijhkl_crbo fh^_e_c
 Fh^_ev EkhZl_jjZ
 >bnn_j_gpbZevgu_ mjZ\g_gby \ qZklguo ijhbah^guo
 ljb_fju fh^_evguo aZ^Zq
 J_r_gb_ \hegh\h]h mjZ\g_gby We_dljhg gZ ijyfhc

13. MjZ\g_gb_ Rj_^bg]_jZ
 <u\h^ mjZ\g_gby i_j_ghkZ b h[eZklb_]h ijb_f_g_gby
 Qbke_ggu_ f_lh^u j_r_gby mjZ\g_gby i_j_ghkZ
 ljb[eb`_gggu_ f_lh^u j_r_gby mjZ\g_gby i_j_ghkZ
 Weebilbq_kdb_ mjZ\g_gby
 J_r_gb_ aZ^Zqb >bjboe_ ^ey k\h\ggguo th [i\Zklj_Zog
 JZaebqgu_ f_lh^u j_r_gby aZ^Zqb >bjboe_
 MjZ\g_gb_ =_evf]hevpZ J_r_gb_ mjZ\g_gby =_evf]he
 ljb_^_gb_ weebilbq_kdh]m ihjZ\g_Zg_ymjZ\g_gbx =_ev
 Mkeh\by baemq_gby
 @_kldb_ bfZy]dZ]lBq_kdb_ fh^_eb
 Fh^_eb khi_jgbq_kl\Z
 WdhghfbdZ dZd ^bgZfbq_kdZy kbkl_fZ
 Fh^_ev Khehm
 Fh^_ev W\ZgkZ
 Fh^_ev jZa\blby ihimeyppbc
 Fh^_ev \hcgu EZgdZkl_jZ
 Fh^_ev FZevlmkZ
 Fgh]hmjh\g_\Zy khpbZevgZy fh^_ev
 Djb\Zybggb



- ljb hp_gd_ hl_IZ mqblu\Z_lky
- iheghIZ b ijZ\bevghklv hl_IZ
- kl_i_gv hkhagZgghklb b ihgbfZgby bamq_ggh]h
- mh_gv hnhjfe_gby hl_IZ

| | |
|-------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ©Hlebqgh ^a klZ\ _keb klm^_gl | - h[klhyl_evgh b ^hklZlhqghfZheghZb - h[gZjm`b\Z_l ihegh_ ihgbfZgb_ f h[hkgh\Zlv k\hb km`^_gby ijb_klb ijb - kljhbl hl_l ihke_^h\Zl_evgh |
| ©Ohjhrh ^a klZ\ _keb klm^_gl h[gZjm`b\Z_l ag ihgbfZgb_ fZI_j h^gZdh | - ^himkdZ_l _^bggbqgu_ hrb[db hgd kZfhklhyl_evgh ihke_ aZf_qZgbc ij_ih^ - g_ \k_] ^Z fh`_l m[_^bl_evgh h km`^_gb_ - ^himkdZ_l hl^_evgu_ ih]j_rghklb |
| ©M^h\^e_l\hjbl_ klZ\blky _keb h[gZjm`b\Z_l ag ihgbfZgb_ hkgh | - baeZ]Z_l fZI_jbZe g_^hklZlhqgh ih - g_ fh`_l h[hkgh\Zlv k\hb km`^_ g_h[oh^bfu_ ijb_fju gZjmrZ_l ihke_ |

| | |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| l_hj_lbq_kdbo ih eh`_gbc l_fu | baeh`_gbb fZI_jbZeZ |
| ©G_m^h\ e_l\hj b klZ\biky _keb | - h[gZjm`be g_agZgb_ [hevr_c qZk \hijhZ - ijb hl_l_ gZ \hijhk bkdZ`Z_l_]h k - baeZ]Z_l fZI_jbZe [_kihjy^hqqh b |

II.E

K

1. <u\h^ mjZ\g_gby i_j_ghkZ b h[eZklb_]h ijb_f_g_gby
2. Qbke_ggu_ f_lh^u j_r_gby mjZ\g_gby i_j_ghkZ
3. ljb[eb`_ggu_ f]lhr^gby mjZ\g_gby i_j_ghkZ
4. Fh^_ev \hcgu beb kjZ`_gby
5. HilbfbaZpby dZd imlv d dZIZkljhn_
6. @_kldZy fh^_ev dZd imlv d hrb[hqguf ij_^kdZaZgbyf
7. HiZkghklv fgh]hklmi_gqZlh]h mijZ\ e_gby b fZI_fZlbq_kd

D

E

| Djbl_jbc | Lj_[h\Zgby | FZdkbfZev dhebq_kl\h] |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| AgZgb_b ihgbfZgb_l_hj_ h]h fZI_jbZeZ | -jZkkfZljb\Z_fu_ihgylby hij_^ q_ldh b ihegh ijb\h^ylky khhl_lkl\mxsb_ ijb_kijh_evam_f ihgylby kljh]h khhl_lkl\mxl l kZfhklhyl_evghklv \jZfhegu_gb | 1 |
| :gZeba b hp_g bgnhjZpbb | -]jZfhlgh ijb_fgy_lky dZI_]hjb mf_eh bkihevamxky ijb_fu k h[h[s_gby ^ey ZgZebaZ \aZb by\ e_gbc -h[tykgyxky Zevl_jgZlb\gu_ jZkkfZljb\Z_fmxi_jh[eh_kfgrh\Zgg bgl_jij_hb_jkyl_dklh\Zybgnhj y ebqgZy hp_gdZ ijh[e_f_ | 1 |
| Ihkljh_gb_km`^ | - baeh`_gb_ ykgh_ b q_ldh_ - ijb\h^bfu_^hdZaZI_evkl\Zeh] \u^\bgmlu_ l_abku khijh\h`^Z]jZfhlghcZj]mf_gilZpb^ylky jZaebqgu_lhqdb aj_gby b bc -h[sZyhjZ baeh`_gby ihemq_ j_amevlZlh\ b bo bgl_jij_lZp khhl_lkl\m_l`Zgjm ijh[e_fgh klZlvb | 1 |

F

| | |
|-------|--------------------|
| [Zee | m^h\ e_l\hjbl_evgh |
| [ZeeZ | ohjhrh |
| [ZeeZ | hleφgh |

III

H[jZadbglijh evigZ]hu

1. Ijb_klb mjZ\g_gb_ d dZghgbq_kdhc nhjf_ \ dZojZhgby_blayh

$$-\frac{\partial^2 u}{\partial x^2} + x \frac{\partial^2 u}{\partial y^2} = 0.$$

2. GZclb aZdhg dhe_[Zgby [_kdhg_qghc kljmg u hij_ ^

$$\frac{\partial^2 u}{\partial t^2} = a^2 \frac{\partial^2 u}{\partial x^2},$$
 keb gZqZevgh hldhg_gb_ aZ^Zgh mkeh\b_f

$$u(x,0) = \begin{cases} 0, & |x| \geq l \\ l-x, & 0 \leq x \leq l \\ l+x, & -l \leq x \leq 0, \end{cases} \quad]^{\wedge} L- aZ^Zgguc hlij_ahd$$

GZqZevgZy kdhjhklv b \g_rgyy \hafmsZxsZy kbeZ jZ\ggw \ Ih
 fhf_glu \j_ft=0 b=l/2a, t=l/a.

DjbbhgbydhghghcZhu

Ghjfu hp_gb\Zgby hl_l_h\ gZ\hijhjkubq_kdb_

| i | L_hj_lbq_kdbc \hijk | Dhebg_kl\h [Zee^k) |
|---|----------------------------------------------|---------------------|
| 1 | >Zg djZldbc hl_l gZ ihklZ\e | [Zee |
| 2 | >Zg jZa_jgmluc hl_l gZ \hi j_amevIZlh\ | [ZeeZ |

<hafh`gZ]jZ^Zpby \ [ZeeZ

RdZeZ hp_gb\Zgby Hp_gdZ @aZgZ_gh`hjalZqhkdhu \hi
 \uklZ\ey_lky_keb gZ[jZgh g_f_g_ [Zeeh\ ijb hl_l_ gZ
 kemqZ_ \uklZ\ey_lky @g_ aZql_gh^a

DhgukZdbjbbhgbyeyihfmlghcZklZbb

H[jZa_p aZqzlg]h aZ^Zgby

- DeZkkbnbdZpby fZI_fZlbq_kdbo fh^_e_c
- Weebilbq_kdb_ mjZ\g_gby
- GZclb ijyfh_ b h[jZlgh_ ij_h[jZah\Zgb_ Nmjv_ ^ey nmgd

$$f(x) = \begin{cases} e^x, & x \leq 0 \\ 0, & x > 0 \end{cases}.$$

<gmljb djm]ZgZclb]Zjfghgbq_kdm k(r)m gjdgbx Zxsmx gZ]jZgb
 = ^Zggh]h djm]ZU|a gZm\phi-g-xy \phi \le \pi.

Ghjfu hp_gb\Zgby hl_l_Z

| i | KljmdlmjgZy qZklv [be | Dhebg_kl\h [Zee |
|---|---------------------------|------------------|
| 1 | ljZ\bevguc hl_l gZ \hijk | [Zee |

<hafh`gZ]jZ^Zpby \ [ZeeZb

RdZeZ hp_gb\Zgby jZ[hlu

| i | Hp_gdZ | Dhebg_kl\h [Z |
|---|-------------|----------------|
| 1 | AZql_gh | 2-4 |
| 2 | G_aZql_gh | f_g_ |

1. ;hj^h\kdb c Nbabq_kdb_ hkgh\u fZI_fZlBq_kdh]h fh^_eb
b ijZdlbdfm ^ey \mah\hj^h\kdb c K Dhg^jZlv_\Qhm^_jbf:
Ba^ZI_evkl\h XjZc±319 k± L_dkwe_dljhguc W;K XjZcI >
URL: <https://urait.ru/bcode/452264>.

2. =ZjfZr G WdhghfZlB_dZlkq_b_f_lh^u b ijbdeZ^gmq_fhg_b_e
^ey [ZdZeZ\jbZIZ b fZ]bkljZlmju B : < GHj_eZ]fZ < < iN^_h
j_^Zdpb_c < < N± Fhk_Ba^ZI_evkl\h XjZcI k± L_dkl
we_dljhguc W;K XjZcI: <https://urait.ru/bcode/406453>.

3. >m[bgZ B G Hkgh\u fZI_fZlBq_kdh]h fh^_ebjhm\Zq_bkydb
ijhp_kkh\ mq_[gbbddrfij^Zed\mah\ B ±G >Ba^ZI_evkl\h XjZcI
2020. ± k± L_dkl we_dljhguc W;K . XjZcI: >kZcI
<https://urait.ru/bcode/450960>.

4. ?nj_fhX K F_lh^u fZI_fZlBq_kdhc nbabdb \ iZd_l_ kbf\he
ODSOH mq_[gh_ ikkh[b_XK?ynj\frhah\>Fl_ljhiZ\eh\kdbFc
Ba^ZI_evkl\h XjZcI±302 k± L_dklwe_dljhguc XYVZ;KI >kZcI@
URL: <https://urait.ru/bcode/454021>.

5. AZcp_W < bnn_j_gpbZevgu_ mjZ\gfg_biyhbaq^kqgub i_j\h]
ihjy^dZmq_[gh_ ikkh[b_ ^ey AZcaph\>theygbgF Ba^ZI_evkl\h
XjZcI ± 416 k± L_dkl we_dljhguc ;K XYVZcI >kZcI@
URL: <https://urait.ru/bcode/452276>.

6. Kl_deh\ <Hkgh\u l_hjbb bgl_]jbjh\Zgby h[udgh_gguo ^b
mjZ\g_gmq_[gh_ ikkh[b_ ^eyKl_mcbhF Ba^ZI_evkl\h XjZcI
427 k±L_dkl_w_dljhguc W;K XjZcI: <https://urait.ru/bcode/453659>.

7. MjZ\g_gby fZI_fZlBq_kdGc_ebba_cgb_bgl_]jbjm_fu_ mj
mq_[gh_ ikkh[b_ ^ey:<@\@ah\j >JFmjIZabgZL OZ[b[meebg
: ; RZ[Z±F Ba^ZI_evkl\h XjZcI±305 k±L_dkl_w_dljhguc W;K XjZcI
>kZcI@URL: <https://urait.ru/bcode/452775>.

8. R_\Ze^bgZY FZI_fZlBdZ \ wdhghfbq_b_mey [gmah\hkhH
R_\Ze^bgZ^gZmqghc j_^Zdpb_c <±FL Ba^ZI_evkl\h XjZcI
k±L_dklwe_dljhguc W;K XjZcI: <https://urait.ru/bcode/453747>.

7.2.

1. :g^jhgh\ : : L_hjby dhe_[Zgbc : : :g^jhgh\ : : <
F GZm =e j_fZlnbdl

2. ;Z[Zdh\ B F L_hjby dhe_[ZgbcF B_jfFnOZ[Zdh\
3. ;Zmlbg G G F_lh^u b ijb_fu dZq_kl_ggh]h bkke_^\
kbkl_f gZ iehkdhklb G G ;ZmlbgF ?GZmEZhgh_e_fZd^eblba
1990.

4. Dhe_fZ_\ < : WdhghfZlBq_kdh_ fh^_ebjh\Zgb_ Fh^
fZdjhwghfbq_bdb ijhp_kkh\ b kbkl_f <F: XDBL_BZG:\

5. DjZkgsh_dh\ l K ljbgpbiu ihkljh_gby fh^_e_c l K
l_ljh\F Ba^ F=M

6. E_\bg F B FZI_fZlBq_kdb_ fh^_eb wdhghfbq_kdh]h
E_\bg <FZdZjh\ : F Jm[bGZmdZ

7. FZdZjh\ < E FZI_fZlBq_kdZy l_hjby wdhghfbq_kdhc
< E FZdZjh\ : F- Jm[bGZmdZ

8. FZeubog < B FZI_fZlBq_kdh_ fh^_ebjh\Zgb_ wdhghf
F Ba^ M JH:

9. Fb]mebg < < Hkgh\ u l_hjbb dhe_[Zgbc < < Fb]me
Fmkl_ev < G -lZju]G Z mdZ
10. Furdbk : > We_f_glu l_hjbb fZI_fZlBq_kdbo fh^_e_c
©Eb[jhd 2011. ± .k
11. Hj_oh\ G : FZI_fZlBq_kdb fh^_eb \ wdhghfbd_ G :
= E_\bg ? : = Fj[mXG B->BG:
12. KZfZjkdbc : : FZI_fZlBq_kdh_ fh^_ebjh\Zgb_ :
FboZcehF NfafZlebl
13. KZfmwevkhg l WdhghfbdZ LhfZ-,F,,ljHjjKZfmwevkh
14. Lbohgh\ : G MjZ\g_gby fZI_fZlBq_kdhc nbabdb
KZfZjkdbFc GZmdZ
15. :jghev^ < B ^@_kldb_` b ^fy]db_` fZI_fZlBq_kdb_`
kl_j_hlbf FPGFH ± k
16. RZidbg : K FZaZ_\Z_fZlBq_kdb_` f_lh^u b fh^_eb bkl
hi_jZpbc Mq_[gbd ^eyanfaah>ZndDf í k
17. <Zkbev_\ : < Lbohgh\ G : Bgl_]jZevgu_l_mjjZmj]gby
EZgv .í k
18. X^h\bq < B FZI_fZlBq_kdb_ fh^_eb _mlq_k]g_hggihckhg]Zn
KZgd_l_j[m]Zgv í k
19. Dhjbdh\ : F lZ\eh\ K G L_hjby kbkl_f b kbkl_fgu
ihkh[bLhfkdLMKMJ ± k

7.3. Библиография

1. KbkI_fZ ^gpkd Zggh]h h[mq_gby Kfhe_gkdh]h]hkm^Zjkl\
<http://moodle.smolgu.ru>
2. We_dljhggbh_l_qgZy kbkl_fZ <http://bibliobd.smolgu.ru>
3. GZpbhgZevguc hldjuluc <http://www.jkbirul>
4. H[jZah\ZI_ evguc fZI_fZlBq_kdb_` <http://kpbcentk.zl>
5. H[s_jhkkbckdbc fZI_fZlBq_kdb_` <http://www.injilz.ru>
6. DZn_^jZevgZy we_dljhggbh_l_qgZy [b[ebhl_dZ
7. We_dljhggbh_l_qgZy [b[ebhl_dZfZI_fZlBq_kdb_` h nZdmev\lk_dZ]hFh
]hkm^Zjklggh]h mgb_jwvlliblzexmat.ru/books/41.
8. Gh\Zy we_dljhggbh_l_qgZy- <http://www.wilbrad.zu>.
9. Jhkkbckhd[jZah\Zgb_ n_^_jZevgucdhrj]Ze
10. FZI_fZlBq_kdh_ [xjh_j_r_gb_ aZ^Zq ihwvknatborof.Zl_fZlBq_kdb_`
11. G_om^h`_kl_ggZy [vye.bchulidrz

Приложение

hkgZs_ggZy
klZg^Zjlghc mq_[ghc f[_evx fmevlbf_^bZijh_dlhjhfh ghml[m
MgZzblhpy ey ihgby azylbc kfbgZdh] lbiZmihuo b
bgbbmZguo dhgkme]bc ldms] dhglhey b ihfmlghc ZklZbb
hkgZ_ggZy klZg^Zjlghc mq_[ghc f[_evx
Ifsgb ey kZklhyleghc Flu ± dhfivxl_jguc deZkk k ^hklr
k_lb ©Bgl_jg_l^a b WBHK Kfhe=M

Приложение

- KasperskyEndpointSecurity ^ey [bag_kZ KlZg^Zjlguc :H ©EZ
DZki_jkdh]h^a eBb-16115133553-1-6231.
Microsoft Open License, ebp_g4063448 \khklZ\
1. MicrosoftWindows Professional 7 Russian
2. Microsoft Office 2010 Russian

Ihbkdh\u_ kbkl_fu k_lb Bgl_jg_l

**ДОКУМЕНТ ПОДПИСАН
ЭЛЕКТРОННОЙ ПОДПИСЬЮ**

Сертификат: 6314D932A1EC8352F4BBFDEFD0AA3F30

Владелец: Артемюк Михаил Николаевич

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